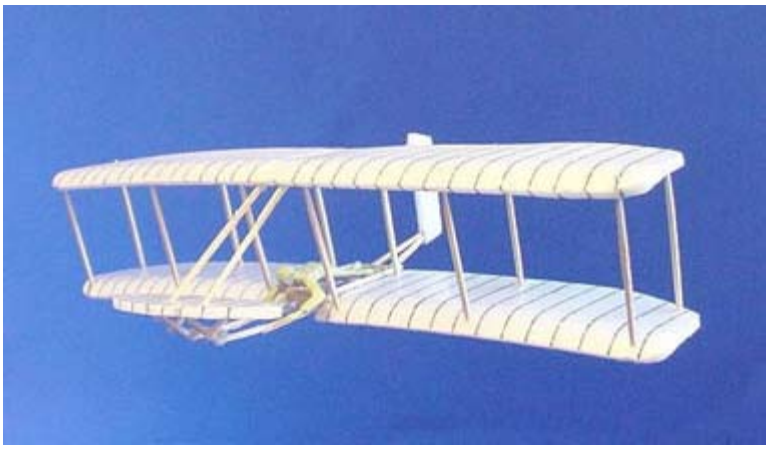
NASAexplores

Model Projects 2002: Aircraft and Aviation

Wright Flyer Models



The 1903 Flyer (5-8)

A replica of the Wright Flyer made from styrofoam meat trays, popsicle sticks and toothpicks.
[Teacher Sheets] [Student Sheets] [Printer-Friendly Version]

Eat Wright (K-4)

Build an edible model of the Wright brothers' first airplane.
[Teacher Sheets] [Student Sheets] [Printer-Friendly Version]

Did you know that...

- Wilbur and Orville Wright flipped a coin on December 14th, 1903, to see who would be the first to fly. Wilbur won the toss. That first flight was unsuccessful, and Orville would have the honor of making the first powered flight on December 17th.

- Orville and Wilbur never married. Wilbur said that he didn't have time for both a wife and an airplane.

Aircraft Models

Air Power (9-12)
Use balloons to model a rocket engine.
[Teacher Sheets] [Student Sheets] [Printer-Friendly Version]

Changing Wings (K-4)
Build a styrofoam glider and test different wing shapes.
[Teacher Sheets] [Student Sheets] [Printer-Friendly Version]

Collapsible-Wing Airplane (K-4)
Construct and deploy a collapsible-wing airplane out of of common household items.
[Teacher Sheets] [Student Sheets] [Printer-Friendly Version]

Flight Model (5-8)
Learn how to change the flight characteristics of a glider made from styrofoam and toothpicks.
[Teacher Sheets] [Student Sheets] [Printer-Friendly Version]

Flying Wing (5-8)
An acrobatic flying wing made from plastic foam trays.
[Teacher Sheets] [Student Sheets] [Printer-Friendly Version]

Glider Characteristics (5-8)
Build and test a glider made from styrofoam and toothpicks.
[Teacher Sheets] [Student Sheets] [Printer-Friendly Version]

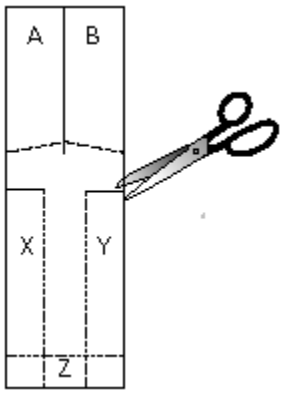
Paper Winglets (9-12)
Test the effects of winglets using a paper airplane.
[Teacher Sheets] [Student Sheets] [Printer-Friendly Version]

Right Flight (K-4)
Construct a styrofoam glider and determine its weight and balance.
[Teacher Sheets] [Student Sheets] [Printer-Friendly Version]

The Right Weight (K-4)
Identify the center of gravity for a glider and test the effects adding weight will have on its flight characteristics.
[Teacher Sheets] [Student Sheets] [Printer-Friendly Version]

Rotor Motor (K-4)

Construct a paper rotary wing model.
[Teacher Sheets] [Student Sheets] [Printer-Friendly Version]



Testing Aircraft Design (9-12)

Design and build a paper, cardboard, or balsa wood plane.
[Teacher Sheets] [Student Sheets] [Printer-Friendly Version]

Wing Designs (5-8)

Test different wing designs on a glider made from styrofoam and toothpicks.
[Teacher Sheets] [Student Sheets] [Printer-Friendly Version]

Winglet Or Not? (K-4)

Test the effects of winglets using a styrofoam airplane.
[Teacher Sheets] [Student Sheets] [Printer-Friendly Version]

Aircraft-related Models

Build a Table-Top Airport (5-8)

Build an airport using cardboard boxes.
[Teacher Sheets] [Student Sheets] [Printer-Friendly Version]

Frosty (9-12)

Model how ice builds up on airplane wings.
[Teacher Sheets] [Student Sheets] [Printer-Friendly Version]

Let's Build a Table-Top Airport (K-4)

Build an airport using cardboard boxes.
[Teacher Sheets] [Student Sheets] [Printer-Friendly Version]

Wind Tunnel Model (5-8)

Build a functioning wind tunnel.
[Teacher Sheets] [Student Sheets] [Printer-Friendly Version]

Wind Tunnel Model (9-12)

Build a functioning wind tunnel.
[Teacher Sheets] [Student Sheets] [Printer-Friendly Version]

First Powered Flight

By ***June 1903***, Orville and Wilbur Wright had finished designing and building their powered machine. The Flyer had a wingspan of a little more than 40 feet (12 meters), a surface area of 510 square feet (47 square meters), and weighed 625 pounds (283 kilograms). They constructed as much of the Flyer as they could in Dayton, Ohio; then shipped the parts to Kitty Hawk for final assembly.

The brothers arrived at Kitty Hawk ***September 25th*** and spent the next two months working on the Flyer. It was ready for flight on December 12, but the winds were too light to take off. They did not attempt a flight on Sunday, since they had promised their father they would not fly on the Sabbath.

Their first attempt at powered flight took place Monday, ***December 14th***. The Flyer climbed a few feet, stalled, and then settled onto the ground near the foot of the hill. The machine was damaged slightly. Repairs would take two days.

On ***December 17th***, the weather was rough—rain and strong winds. The brothers decided to go ahead despite the wind about 10:00 a.m. The first flight lasted 12 seconds and went about 120 feet (36.6 meters). The second flight, at 11:20, went 175 feet (53 meters); the third flight, at about 11:40, was about 200 feet (61 meters) long.

The fourth flight took off around noon with Wilbur at the controls. The flight began like the others—with the Flyer pitching upward and down. After about 300 feet (91 meters), Wilbur got it under control and began traveling on a fairly even course. He proceeded this way until he was around 800 feet (244 meters) out. Then the Flyer began bucking again and suddenly plunged into the ground. The front rudder frame was badly broken, but the main frame was intact. It had traveled 852 feet (260 meters) in 59 seconds.

Unfortunately, a gust of wing flipped the Flyer over and destroyed it. It had accomplished a milestone, but would never fly again. The brothers would ship the remains home to Dayton.

For more information and historic photos, see the U.S. Centennial of Flight Commission page on the First Powered Flight, 1903